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TITLE: MANUFACTURE OF SEMICONDUCTOR DEVICE

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INVENTOR-INFORMATION:

NAME

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ABSTRACT:

PURPOSE: To enhance a workability of an SiN film as a protective film of a semiconductor substrate by a method wherein an ion of argon or the like is first implanted into a silicon nitride film on the semiconductor substrate and the ion-implanted silicon nitride film is treated with a hydrogen plasma.

CONSTITUTION: An SiN film 2 of 1000Å is deposited on a GaAs substrate 1 by an ECR plasma CVD method; an annealing operation is executed by using a lamp at 850°C for a short time of 5 seconds. Then, the SiN film 2 is coated with a resist; a resist layer 3 is formed; the resist layer is exposed to light by photolithography and developed; a resist pattern having an opening 3a is formed. Ar ions 4 are implanted selectively into the SiN film 2 by making use of the resist pattern as a mask material. After this ion implantation, a hydrogen plasma treatment to give a hydrogen plasma 5 to the SiN film is executed. As a condition for the hydrogen plasma, a plasma is generated at a hydrogen pressure of 1Torr and at a high frequency of 13.56MHz; the SiN film is treated for 30 minutes. After that, an etching operation is executed by using buffered hydrofluoric acid; then, the resist layer 3 is removed; the SiN film 2 having an opening 2a is formed on the substrate 1.

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